‘Avoiding the certainty trap’:
A research program for the policy-practice interface

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Abstract

This paper outlines the rationale for a research focus on how meaning emerges from the interfaces between research, policy and practice. In exploring where different constructions of risk, resilience and landscape occur in the policy and practice discourses surrounding current developments in Victorian bushfire policy, this paper goes beyond simply advocating better science-policy-practice relationships by demonstrating the challenges of operationalizing adaptive governance principles. Our findings stress that change can arise from interacting discourses on the policy-practice interface. Yet, while this may be the most adaptive moment in the policy process, producing multiple insights and alternative options, it is vulnerable to institutionalised discourses that obstruct flexible practice. Complex socio-ecological issues such as bushfire, we argue, require more explicit engagement with the processes of practice inherent in policy formulation. The paper offers co-productive research strategies as contributing to more flexible governance arrangements to improve adaptive policy design.

Keywords: policy implementation, practice, socio-ecological resilience, adaptive governance, cooperative research

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INTRODUCTION

The case study discussed in this paper revolves around two elements of bushfire policy in the state of Victoria, Australia. One is the current policy of prescribed burning adopted by the state's centre-right Coalition government, stipulating that 5% of the public estate be subjected to annual fuel-reduction burns. The other is a policy guidance framework for fire landscape management developed by the Department of Sustainability and Environment (DSE, hereafter referred to as the Department).[1] This Bushfire Risk Management Planning Framework (the Framework) is part of a Bushfire Management Reform Program (DSE, 2012b), following recommendation by the Victorian Bushfires Royal Commission that changes to the existing Code of Practice for Bushfire Management on Public Land be made after the devastating 2009 Victorian bushfires (VBRC, 2010a). While it prioritises human life, vital infrastructure and property, the Framework aims to integrate sustainable, landscape scale natural resource management (NRM) with bushfire disaster risk management (DRM). It further focuses on improving communities' understanding of the role of fire in their landscapes, with a plan of actively engaging them in bushfire planning, preparedness, and response (DEPI, 2013; DSE, 2008).

The research project underlying this case study was conceived in collaboration with strategists from the Department's Bushfire Planning and Knowledge section to aid practice change in bushfire landscape management. In exploring where different constructions of fire risk and resilience happen in the policy and practice discourses in the bushfire policy domain, this paper

[1] Now the Department of Environment and Primary Industries (DEPI), following restructure in 2013

outlines a research agenda that focuses on how meaning not only precedes but also emerges from the interfaces between fire-related research, policy and practice.

At the core of our argument is recognition that development of any policy is a series of practices reflective of interacting discourses (Kern, 2011). That is, our understanding of the 'doing' of the policy process includes communication, knowledge exchange, networks and interactions across the administration as much as the on-ground policy implementation (Holman, 2013). Dominant, institutionalised culture informs and reinforces organisational discourse. This shapes not only what is discussed but instils a way of knowing and doing that is expected to exemplify the organisation's aims and purposes (Weick, 1969; Wenger, 1998). Thus, social practice is a form of meaning-making that transcends and informs interactions across the strategic and operational levels of the organisation (Schön, 1983). While the literature acknowledges that this has implications for the selection of policy problems and solutions, the formation and flows of knowledge, and how we organise ideas about actions (Schön and Rein, 1994; Wagenaar, 2011), the often informal ways in which discourses of practice inform policy remain under-acknowledged (Atkinson and Joyce, 2011; Conrad et al., 2011 ; Pelling and Manuel-Navarrete, 2011).

Risk management discourse, responding to societal needs for certainty and accountability, tends to rely on science-based policy frameworks, while lacking reflection on socio-cultural and individual factors of risk. Following the knowledge-action logic, risk discourse in public administration adheres to the traditional knowledge paradigm wherein knowledge is taken to be objective and understood as prior – and superior – to the production of meaning through practice (Lo, 2011). Techno-scientific risk approaches form the basis of cost-benefit calculations and, importantly, are based on the assumption of rational risk perception and behaviour among

various practitioners and communities (Lupton, 1999). However, the current case study illustrates that in complex NRM policy situations 'more' expert knowledge does not simultaneously mean 'better' policy, nor can knowledge be conceived as an 'objective' set of information that leads to optimised practice (Baud et al., 2011; Ison et al., 2007; Paschen and Ison, 2011, 2012).

The strategic focus in adaptive NRM policies tends to lack guidance for practical implementation (Clark, 2006; Juhola, 2013; Olsson et al., 2006). Rijke et al. (2012, p. 76) observe 'a mismatch between the existing institutional frameworks in which policy makers and practitioners operate and the principles of adaptive governance, such as flexibility and self-organisation'. While this is most palpable at the operational level, practitioners at this level are also well placed to address it, as their participation in various networks can provide understanding of emergent on-the-ground realities, including institutional constraints that impede learning from a range of experiences. We therefore identify an explicit need for practice-based experience to inform policy for more effective NRM outcomes in the landscape.

As Cook and Wagenaar (2011, p. 9) point out, a lot of practice knowledge is tacit knowledge that cannot be quantified or made explicit. This knowledge includes 'what is said and what is left unsaid' due to 'all the implicit relations, tacit conventions, […] underlying assumptions, and shared world views' that characterize – and regulate – communities of practice (Wenger, 1998, p. 47). Practice modifies knowledge, context and meaning – be it in the practice of policy discourse within the organisation or as a consequence of individuals interpreting the dominant narratives into 'fire work' on the ground (Cook and Wagenaar, 2011). It is therefore crucial that elements of practice are considered and a number of questions asked, including who interprets a given policy or concept, at what stage of the policy process, and, in what ways.

Our case study is situated within the context of the public policy issue of landscape fire management, and explores that policy domain's practice discourses. We begin by outlining the case study background and the theoretical underpinnings of how we think about practice, including how our cooperative research is based in an 'epistemology of practice' (Cook and Wagenaar, 2011, p. 7). This epistemology defines how we actively engage in the situation we study, contributing to the creation of deliberative platforms as part of our critical research practice through the use of narrative interviews and workshop conversations (Game and Metcalfe, 1996). We then follow the main threads of the 'policy practice web' that we have identified. Tracing how and where operational concepts are interpreted, or 'practiced', reveals the profound role played by the social dynamics of informal or 'shadow systems' in policy formulation (Olsson et al., 2006; Pelling and Manuel-Navarrete, 2011, p. 12; Vaughan and Rafanell, 2012). Our findings stress that this perhaps most adaptive moment is simultaneously most vulnerable to institutionalised discourses. In this context, our engaged research approach aims to create an understanding of the benefits of practice informing policy and to help facilitate an organisational culture that views dialogue and exchange not as an impediment to the implementation of a policy but as a vital instrument of adaptive thinking and flexible response (Walkerden, 2009).

The discussion of the implications for future collaborative research strategies and reflective policy practice also pays attention to the operational challenges of this research program, and of practice change in the contexts of adaptive governance and 'management as learning' approaches more widely (Boyd and Ghosh, 2013; Clark, 2006; Davoudi and Evans, 2005; Dupuis and Knoepfel, 2013; Everingham et al., 2013; Pahl-Wostl, 2007; Rijke et al, 2012). What is suggested here has potential relevance across a range of other policy contexts where it may help

to unlock synergies with practice knowledge – or 'practice as knowledge-making' – and across policy silos for more successful policy design in adaptation contexts.

BACKGROUND - The case study and its methodological premises

The case study is located on the interface of practice discourses surrounding the current Victorian government's bushfire policy, the 5% burns target, and the Department's Bushfire Management Reform Framework as a policy guidance document. Specifically, we examine how the Framework's meaning unfolds in the everyday operational practices of interpreting its key terms and objectives within the discursive landscape of the '5%-target' policy.

The policy is based in a number of recommendations made by the Victorian Bushfires Royal Commission (VBRC, 2010a), after bushfires in 2009 claimed an unprecedented number of lives and properties in Victoria. Yet, while the Commission recommended that the annual fuel reduction burns be increased to 5% of the public land managed by the Department (recommendation 56), this recommendation was intended in tandem with recommendations providing for an extensive monitoring and reviewing program of the ecological impact of fuel reduction burns (VBRC, 2010a, recommendations 57 and 58). However, the current state government's policy commits solely to meeting the target.

The Reform Framework aims to marry the objectives of minimising bushfire impact on 'human life, communities, infrastructure, industries, the economy and the environment', and second, 'to maintain or improve the resilience of natural ecosystems and their ability to deliver services' (DSE, 2012a, p. 4) via a risk-based approach, which also provides for adaptive learning from practice and observation (DSE, 2011, 2012a). It further introduces the concept of seven Risk Landscapes as new strategic management units across the state. These are derived from the

predictive fire spread model PHOENIX but are generally aligned to municipal boundaries (ibid.). Nonetheless, the core idea of the Risk Landscape is to move strategic management planning beyond existing tenure-based boundaries and to align it with a landscape-scale perspective. However, while the intended shift from the dominant 'command and control' NRM/DRM narrative arguably results from shifting practice discourses (or alternative management narratives emerging from practice), the pathways and objectives expressed in the Framework are as yet lacking a practice base. The translation into practice or more accurately, the 'practicing' of the Framework and its key components is the task of newly established Risk Landscape teams, and the subject of our case study.

Our research partnership with strategists from the Department's Bushfire Planning and Knowledge team arises from the recognition that practice change requires critical reflection on the social practices of knowledge construction; here pertaining to our interrogation of the Framework's key concepts, risk and resilience, and their attendant practices. Our interest is in 'the internal life of process' (Brown and Duguid, 2000, p. 95) and the meaning-defining role of 'the practices by which work is actually done' (Whittington, 2003, 118). Based in a broader practice turn in the social sciences (Bourdieu, 1990; de Certeau, 1984; Weick, 1969), we draw on recent work coming from political science (Cook and Wagenaar, 2011; Wagenaar, 2011), practice and social learning theory (Dewey, 1988; Wenger, 1998) and organizational research (Whittington, 2003). The practice orientation comes with what Cook and Wagenaar (2011, p. 7) call an 'epistemology of practice': rather than taking practice to be the *result* of prior knowledge applied to any given context, it gives primacy to the idea of practice as an active engagement with the world. It pays attention to the messiness of everyday reality and probes into the social interstices and processes underlying practices of knowing (see also Bevir and Rhodes, 2012;

Schön, 1995; Walkerden, 2009). Last but not least, it views the relationship of practice, knowledge and context as *interactive* and *co-emergent* (Cook and Wagenaar, 2011, p. 3).

Our case study accordingly commenced with the formation of the Risk Landscape (RL) teams, accompanying them in the process of assembling the meaning of the Framework over the life of the research project. Thus, we do not simply study the practices arising from a 'finished' policy; rather, the study evolves with the practices that give meaning to the Framework and therefore studies the development of terms and concepts *before* they are manifested in policy. At the time of writing, the case study is still underway, with the first project phase focussing on organisational discourses of risk and resilience within the current bushfire policy domain. Community understandings of these concepts are the focus of a second project phase. From this larger study, this paper extracts the idea of a *practice web* to provide evidence of the social construction of fire and landscape practices in policy discourse.

The first project phase included the review of relevant policy documents to establish the operational terms of the Framework and the case study (DSE, 2008, 2011, 2012a, b). Concurrently with the appointment of two new RL Managers, and the ongoing establishment of their teams, we attended several operational and cross-agency engagement meetings, taking a participant observational role and using the opportunity to recruit for interviews. Semi-structured, narrative interviews were conducted with members of the RL teams, strategic and operational level staff from the Department's Head Office in Melbourne and its Regional Offices, as well as employees across both the Department and Parks Victoria (PV).[2] Interviewees were asked to describe their role and everyday work practice in relation to the target policy and developing implementation of the Framework, leading the discussion to the interviewees'

[2] The state's management authority for National Parks works in close cooperation with the DEPI.

interpretations of risk, resilience and fire landscape management in their specific practice environment. Further, the interviews expanded on the participants' expectations and initial experiences in regards to the Framework's key concepts and reform impact. The number of interviewees is ultimately determined by the number of practitioners in positions and with connections relevant for this study (particularly members of the RL teams) but for the sake of manageability, the data will be capped once thematic saturation is reached (Glaser and Strauss, 1967).

The interviews were conducted according to the principles of cooperative inquiry (Heron and Reason, 2006), encouraging participants' practice narratives around core operational concepts. We acknowledge that as social ethnographers, our research practice is already part of the complex of practices we study (Clifford and Marcus, 1986; Zenker and Kumoll, 2010). As critical theorists, we view this not as a limitation that compromises the object of our study *in situ* but as a welcome opportunity for productive, critical inquiry (Dewey, 1988; Dryzek, 2006), a 'doing and knowing' that becomes part of the 'ongoing action' and reflective practice in a real world situation (Cook and Wagenaar, 2011, p. 14). Conducting research '*with* […] rather than *on* people' (Heron and Reason, 2006, p. 144), this methodology allows for knowledge to be co-produced between the researchers and participants as research questions are revised as appropriate and categories for interpretation emerge from the ongoing analysis (Yanow, 2007). This 'critical inquiry' approach creates a 'deliberative space' as part of the research practice (Ojhaa, 2013, p. 4), which we further operationalize by conducting follow-up workshops with participants. In this way, the study discussed here is as much about constructions of risk and resilience in bushfire policy as it is about exploring the potential of our methodological approach for collaborative research and reflective practice change in policy contexts.

THE CASE STUDY –

I. Background: The 5% target or discourses of bushfire management in Victoria

South-eastern Australia is one of the world's most fire-prone areas (Hennessy et al., 2006). Victorian landscapes have multifaceted relationships with fire. Fire is important for the function of many Australian ecosystems, yet different plant and animal species have different tolerances for fire frequency (Burrows, 2008; Shlisky et al., 2007). While fires are understood to help preserve biodiversity, large-scale, intense bushfires can pose serious threats to human and ecological communities. Due to the biophysical and socio-ecological complexity of bushfires (Bradstock and Gill, 2001; Gillen, 2005), fire management is a complex policy problem faced with a number of challenges. It involves multiple stakeholders and variables across different spatial, temporal and governance scales (Gill and Stephens, 2009).

The policy domain (Burstein, 1991) of landscape fire management has two major objectives – DRM and NRM – and a close working relationship with scientific research in each of these broad disciplines. In theory, each of these objectives and practice fields presents a different dominant narrative. While the DRM narrative is understood to draw on a 'control over nature' storyline, NRM is commonly associated with a 'living with nature' narrative (Bosomworth, 2012). In practice this association holds true to varying degrees. The present 'target policy' exemplifies a case where the dominant NRM narrative is aligned with a 'control over nature' DRM narrative as it is based on the assumption that increased fuel reduction burns will lead to increased control of fire risk. As such, the policy represents a very narrow interpretation of the VBRC's recommendations for fire landscape management, counteracting the original intention of instigating adaptive learning. The policy has therefore greatly polarised public debate (Altangerel and Kull, 2013).

This recent debate is part of a long history of contestation, itself situated within a complex cultural politics surrounding the use of fire for land management in Australia (Gill, 1994; Whittaker and Mercer, 2004). In particular, the usefulness of large-scale burns for social and ecological management objectives is challenged by researchers both in regard to their effective risk reduction (including their cost-effectiveness) and their effects on biodiversity (Penman et al., 2011; Price and Bradstock, 2013). Researchers and practitioners alike emphasise the need for smaller burns, placed more strategically around towns and dwellings (Interview, 2012-2013; Price and Bradstock, 2012). How and why proponents of prescribed burning prevailed at this particular point in time, and the target became policy, may be illuminated by looking at the practice narrative of the 5% target. This leads us to a discussion of the political and organisational pressures working on the emergent meanings of the Framework following the 'web' of its practice discourses.

In addition to desk research and submissions from the affected public, the Royal Commission drew on advice from a panel of experts in fire behaviour and fire ecology as well as on social research conducted after the bushfires (VBRC, 2010b). The resultant recommendations for land and fuel management were made with strategic considerations in mind, and with the aim of achieving a combined set of DRM/NRM objectives (S.K., Interview, 2012-2013; VBRC, 2010a). Importantly, the VBRC seemed to acknowledge that fire cannot be eliminated from the Australian landscape, so land managers and communities will need to learn to live with fire as a regular occurrence. More frequent, moderate and controlled fires are argued to emulate natural fire regimes where past policies of suppression have decreased the frequency but increased the intensity of bushfires to the detriment of both humans and ecosystems (DSE, 2012b, 7). This argument, while it is contested (Altangerel and Kull, 2013; Penman et al., 2011; Price and

Bradstock, 2013), underlies the clause of the burn target (VBRC, 2010a, recommendation 56), modified by the provision of ecological checks and balances (recommendations 57+58). One interviewee explains the VBRC's strategic thinking thus:

> *... I honestly think that the Royal Commission didn't believe that 5% was the answer either [...] I think their long term objective [was] that we need to reintroduce fire back into the landscape [...] but without an expectation that that change then becomes the long term solution. It's just an interim measure to get things rolling [...] Because the recommendation (sic) [...] basically said, "5% but set up a comprehensive monitoring program and review the whole process." [...] what they were saying is, "We don't feel as though we know enough at the moment to make a specific recommendation so let's go with 5% and the next two recommendations are our checks and balances." So I think they were wily enough to say that, "This is not going to happen, unless we have something, a very specific target."* (S.K., Interview, 2012-2013)

According to this account, 5% was a preliminary recommendation to satisfy the practical need for an *actionable* (metrically specified) target *likely* to reduce the risk of high intensity bushfires. The actual proportion of 5%, however, is an approximation without empirical evidence from practice of both its effective risk reduction and likely ecological impact (S.K., Interview, 2012-2013). Indeed, in light of more expected heat waves and a rapidly extending urban fringe, it is unlikely that any degree of uncertainty can be reduced as desired. Current analysis based on PHOENIX shows that residual risk levels do neither fall significantly nor proportionately to the public land area subjected to fuel reduction burning. Risk is currently measured as impact risk on 'address points' (i.e. houses) (Participant observation notes, 2012). Risk analysts we interviewed acknowledge the limitations of the risk profiles gained in this way:

> *... we do our one kilometre grid of ignition, PHOENIX starts a fire in every kilometre grid and it runs and it creates an output and the number of times that an asset is hit by a fire is an impact risk. So if one house is hit by ten different fires then it's got a risk of ten or if ten houses are hit once it's also ten. [...] and it's not perfect, of course it's not perfect but it's the best we've got [...]* (A.R., Interview, 2012-2013).

Despite current risk modelling limitations and evidence challenging the effectiveness of large-scale prescribed burns, the government's policy response to the VBRC focuses on reaching the 5% target (State of Victoria, 2010), neglecting the advice to further understanding of the ecological landscape. This adherence to the dominant 'control over nature' narrative is set against the background of collective trauma in the wake of the 2009 bushfires and a centre-right coalition government aligned with productivist values of landscape management – in office since late 2010 – who had prominently opposed the previous government's less invasive NRM direction. When Giddens (1999) describes the relationship between risk and politics as ranging between scaremongering and cover-up, he points to the alignment of risk discourse with power and its function to regulate society (see also Beck, 1992; Lupton, 1999; O'Malley, 1992). In its most obvious political function it works to shift blame to the opposition and to reinforce notions of the government's knowledge authority. The positivist risk focus underlying the target narrative asserts that bushfire risk is knowable using tools such as PHOENIX and other probability calculations. In this way, 'uncertainties are organised in order to transform them into governable risks' (Lidskog and Sundqvist, 2012, p. 1017). As a consequence, societal discourse around risk is skewed to a series of mechanistic actions that reify particular kinds of response practices: the burning of 5% of public lands becomes a surrogate for managing bushfire risk. As risk probability measures underlie decisions about resource allocation, more resources are

focussed on reaching the target than on ecological monitoring or community consultation, at least in the short term (N.L. and P.A., Interview, 2012-2013). In this perspective, the focus on the 5% target narrative appears politically motivated, seizing the opportunity to put apparently 'value free science' to the service of populist government rhetoric. Paradoxically so, it appears, as the 5% target, with its intention to produce a preliminary target, is *not* actually based in scientific evidence. As the government policy nonetheless presents it as a 'solution' to the 'problem' of bushfire risk, this has implications for how the nature of that risk is constructed, and consequently, what kind of resilience is envisioned.

Theoretical perspectives on risk range from realist-positivist and techno-scientific constructions of risk, to relativist-constructivist, cultural-symbolic, or psycho-social perspectives (Douglas and Wildavsky, 1982; Lupton, 1999; Slovic et al., 2004). Contemporary risk practice, particularly in policy contexts, tends to lean toward the techno-scientific end of that range and focuses on bushfire as abnormal, one-off events (as opposed to a regular natural occurrence) (Lash et al., 1996). Yet, research shows that risk is a complex and volatile concept. Its perception is not only shaped by scientific insight but also by cultural, societal, individual and experiential factors and practices, including place attachments, landscape imaginings, and the factors of time and social-ecological memory (i.e. how often or recently bushfires have occurred) (McCaffrey, 2008; Paton et al., 2006; Reid and Beilin, 2013).

The 'risk as hazard' focus underlying the target policy simplifies a complex concept by neglecting other contextual (and less predictable) factors of risk, in particular community interactions with fire or socio-economic factors increasing people's exposure and vulnerability. It also tends to focus on the 'human' side of risk at the expense of ecological objectives. It is accompanied by a similarly simplistic resilience narrative:

> *Yeah, well we didn't have much around ecological resilience. We can measure a surrogate of human resilience if you like by looking at house loss, that's what we're doing at the moment.*
>
> *Question: So, human resilience – is [house loss] the sole measure?*
>
> *It's the one we're mainly using at the moment because of using PHOENIX. But clearly, there's a lot of other resilience measures. You might look at social connectivity or how much disruption there is to social networks, to economics, to everything about their wellbeing, I suppose* (B.G., Interview, 2012-2013).

Resilience as it is (implicitly) used under the target narrative seems to equate to the 'control of risk', another very narrow interpretation of a complex concept. In particular, the idea of ecological resilience seems curiously underrepresented in this narrative. This is noteworthy as one of the most seminal definitions of resilience originates in ecological science as the 'measure of the persistence of systems and of their ability to absorb change' (Holling, 1973, p. 14). In both DRM and NRM policy discourses resilience has become a popular term that nonetheless lacks a shared conceptual basis (Brand and Jax, 2007), and is particularly short of a thorough theoretical and empirical grounding in the social sciences (Aldunce, 2013; Brown, 2011). In DRM discourses it is used mainly in terms of an 'equilibrium or engineering resilience' and in reference to the 'recovery' or 'bouncing back' of either ecological or social systems following disturbance (Folke, 2006; Holling and Meffe, 1996). Resilience, such is the underlying logic of this conceptualisation and attendant political discourse, can be 'engineered' by using the 'right' risk management models such as 'risk forecasting methods based on probabilistic calculations' (Amin, 2013, p. 141). In this vein, '[e]ngineering resilience focuses on maintaining efficiency of

function, constancy of the system, and a predictable world near a single steady state' (Folke, 2006, p. 256). 'Community resilience', too, has become a buzz word in DRM political discourse, referring to 'human capabilities' (Amin, 2013, p. 146) and 'the heroism of individuals who spring forth during an emergency' (ibid., p. 141). Adaptive capacity, self-reliance and shared responsibility are contested catchphrases in this context. In its broad usage the concept of resilience is becoming an increasingly ambiguous 'boundary object' whose 'vagueness and malleability' make it 'politically successful' (Brand and Jax, 2007, p. 9) – or politically exploitable as critics of a 'resilience discourse' caution (Amin, 2013; Walker and Cooper, 2011). As a 'conceptual metaphor and rationale for the governance of emergency', as Welsh (2013, p. 6) warns, 'resilience' is easily put to the service of neoliberal politics, potentially aiding devolution of risk to communities. It is important to point out that this framing of 'engineering' resilience separates people from their environments. It profoundly contradicts alternative theoretical conceptualisations of community resilience, which incorporate psychological notions of resilience and are based around ideas of change, complexity, alternative governance arrangements, and self-organisation in *coupled socio-ecological systems* (Adger et al., 2005; Aldunce et al., 2011; Berkes and Folke, 1998; Gunderson and Folke, 2005; Norris et al., 2008).

II. Practice to policy and practicing policy – the Framework

As the State's public land manager, it is the Department's legislative responsibility to meet the 5% burns target as decreed by the policy. However, that policy's 'control over nature' DRM narrative conflicts with the Department's broader NRM mandate to maintain the viability and resilience of the environment (DSE, 2012a) and creates other conflicts at the practice level: In addition to the uncertain long-term impacts on ecosystems, smoke and flames from prescribed burns impact businesses such as wineries and tourism and bear the danger of 'escaping' control,

starting a bushfire (ABC News Online, 2012). Changes in climate and vegetation determine the 'treatability' of landscape (B.G. and S.G., Interview, 2012-2013). Victoria's wet temperate Mountain Ash forests exemplify this as they are virtually 'untreatable': they do not burn when wet but will burn uncontrollably when dry. One interviewee sums up the dilemma faced by the Department under the current dominant narrative:

> *The government's got policies of "thou shalt do planned burning". So while it's not the only strategy, it's probably the strategy that has got also the greatest risk for us, because if we use it in the wrong way the impacts on ecology or on people or on whatever are huge as well. So it's our greatest tool, but it also can be our greatest undoing as well.* (M.Y., Interview, 2012-2013)

In addition to the primary objectives of minimizing risk to human life, infrastructure and ecosystem resilience, the Framework pursues an adaptive approach to bushfire management. Alongside the introduction of the concept of the Risk Landscape as a new 'tenure-blind' management unit that aims to work across agencies and public/private boundaries (DSE, 2011, p. 4), a number of objectives named in the Framework indicate intended practice changes, particularly the consideration of alternative management options. While the approach continues to utilise models to measure and predict likely outcomes of management strategies, there is also a clear focus on monitoring and reviewing processes that aim to ensure that the Department's long-term, flexible and adaptive perspective is based on continuous learning from practice (DSE, 2012b). The Framework, the document emphasises, aims to be 'holistic' and is viewed as evolving process (DSE, 2011, p. 6). In addition to the role of experienced personnel, 'meaningful community and stakeholder involvement' is stressed as 'critical' to the building of a 'sound knowledge base' for adaptive decision making in changing circumstances (DSE, 2012b, p. 12),

as is the need for 'rigorous and transparent processes' for the setting of planning objectives (ibid., p.10). A procedure of 'value optimisation' around the 'PIPE$S model' (People, Infrastructure, Public Administration, Environment, Economy, Social Setting) is to enable 'discussions on preferred actions' (DSE, 2011, p. 1; and DSE, 2012a, p. 8). However, a number of underlying assumptions arguably out of touch with real life complexities must be noted here, such as the problematic construction of 'community' as seemingly homogenous and static.

The RL teams are tasked with the development of Strategic Bushfire Management Plans (DSE, 2011, p. 8). As there is currently 'no common definition, understanding or agreed outcome for a formal risk-based approach to bushfire management' (DSE, 2012b, p. 11), the teams operate with the risk concept specified by the Code as the 'effect of uncertainty on objectives' (DSE, 2012a, p. 6). As per the Code's primary objectives, this includes the notion of impact risk as well as risk to ecosystem resilience posed by both bushfires and management options (DSE, 2012a, p. 8). Thus, the RL teams face the significant challenge of working with two competing objectives, each with its own understanding of risk attached. Interview participants reflected on the early process of interpreting key ideas of the Framework:

> *We have to discuss things and agree with them. And people have different opinions and passions [...] one thing I was a bit worried about when we got to a bigger team is that – because there's all these little boxes that things would develop in, it would be hard to actually bring things together. But it's been really positive [...] it is a real collegial approach to it, actually talking and contributing* (B.B., Interview, 2012-2013).

> *I like the fact that when we have [team] meetings, people are contributing outside of their spheres [...] there's different perspectives you can bring to it* (S.B., Interview, 2012-2013).

Interviewees experienced this 'sense making' phase as productive space for negotiations of meaning. Contrary to concerns that this would fragment the process, the interpretation of core concepts was enriched by the team members' variety of professional perspectives. This exchange also encouraged creative advancement of existing technologies, such as feeding an ecological or 'species layer' into PHOENIX (A.R., Interview, 2012-2013). The community engagement practitioners were similarly working to integrate community consultation into the risk analysis process (N.L. and B.B., Interview, 2012-2013). Funding priorities, however, considerably prefigure the practicing of the Framework: current risk profiles do not yet include ecological or community aspects due to a later start of corresponding staff positions. Consequently, practitioners are concerned that communication may revert to top-down information, 'like we've created a plan, and then take it out to the community' (N.L., Interview, 2012-2013).

The need to produce 'quantifiable outputs' to feed into the planning process creates significant pressures for practitioners (from Interviews, 2012-2013). Following recommendation of the Royal Commission Implementation Monitor for a review of the policy (Department of Justice, 2012), and a ministerial brief (DSE, 2011), the Department received authorization to investigate other options of bushfire management (P.C., Interview, 2012-2013). Yet, as the Department had to commit to delivering operational management plans within a twelve month time frame, the actual space to explore alternative thinking and options is limited (W.G., Interview, 2012-2013).

This has implications for how key concepts are practiced and communicated externally. For example, environmental impact assessment of prescribed burns is a long-term process requiring monitoring and evaluation before any adjustment of management options can occur. Planning relies on the notion of 'acceptable deviation' from optimal vegetation growth stage distributions as a measure of risk to ecosystem resilience. While this appears 'scientifically sound', it is inseparable from social factors and can only be an approximate construction set to satisfy institutionalised notions of knowledge-action (i.e. defined target equals better management). In fact, ecologists and practitioners rely on their experiential 'gut feeling' to arrive at a preliminary metric to be revised in the future (B.G., Interview, 2012-2013). Such metrics nonetheless mask the reality that ecological knowledge can only be emergent with practice and uncertain future change. In order to determine what is deemed 'acceptable', the Code and the Framework (DSE, 2011, 2012a) specify that transparent discussions be held with local communities. In practice though, the establishment of genuine dialogue and trustful relationships with communities is a complex, lengthy and fragile process easily derailed by funding politics, when measurable 'outputs' fail to materialise (W.G. and N.L., Interview, 2012-2013).

The process is to move away from previous planned burning notification (and consultation on the timing of burns with businesses such as wineries and tourism) and towards increased community involvement in 'proactive' 'strategic fire planning' (A.P., Interview, 2012-2013). Yet, discussions with communities are pending as they depend on the production of 'a message' on behalf of the Department. At the very least, interviewees are currently deferring these discussions to the future (S.B., P.L. and N.L., Interview, 2012-2013). The concern seems to be twofold: first, that 'we won't know what to do with what comes up [from community

discussions]' (N.L., Interview, 2012-2013), and second that too open a discussion on the inconsistencies of the 5% target policy may be construed as criticism of the government:

> *..we don't want to go against what else is happening. There are decisions being made at higher levels [...] and it does actually affect what we can say and what we can't say [...] head office and corporate communications and various steering committees have to agree with what we're saying. [...] It means that while we'd really love to take this stuff out to communities now we can't* (A.P., Interview, 2012-2013).

In the meantime, a balance must be struck across various other considerations, such as to what extent impact risk can be communicated to the public, whether this should include transparency on insufficient evacuation routes, the often fraught practicalities of setting up 'Neighbourhood Safer Places' (in concession to its misleading name now used with the added 'Places of Last Resort'), or other community safety and environmental concerns (N.L., Interview, 2012-2013). This hesitation to communicate what is deemed 'politically impossible' may inadvertently increase community vulnerability (D.A., Interview, 2012-2013). Additionally, not all aspects relevant to this complex of issues are within the remit of the Department but are the responsibility of other agencies. For practitioners, this inconsistent communication throws up the question of what 'community resilience', shared responsibility and engaging communities in decision-making can actually mean:

> *Because there are ways to have conversations without an actual message, if you're just going out and forming relationships these things will come up but with the whole project government structure it's very difficult to do those things unless it's tied to something else. [...]*

> *We're looking at plans that say "We will engage and we will do all these things, we'll build community resilience", but again what does that mean? Our code is we will engage – and we do a lot of informing – [but] whether that's counted as engagement?[...] And then we're not allowed to say anything* (A.P., Interview, 2012-2013).

DISCUSSION

The formulation of a policy objective arguably tends to work top-down, i.e. from a broad perspective such as the target of 'bushfire risk reduction' or 'holistic bushfire NRM'. However, as this case study illustrates, the complex nature of a 'problem' often becomes only visible on the practice interface and within the various practice discourses. In policy change in particular constraining the knowledge input from valuable policy and operational practice expertise, creates a 'policy-practice gap' that constrains the effectiveness of the policy itself.

While the framework advocates a socio-ecological systems view of bushfire landscapes and recognises knowledge as emerging and incomplete (Friend, 2012, p. 2), the intended shift in the Department's bushfire management culture is hindered by the continued dominance of mechanistic approaches. This is a common practice problem of adaptive governance, whereby a lack of defined learning objectives and uncertainty as to 'who should be involved in learning processes' impede 'iterative processes of adjusting governance' (Rijke et al., 2012, p. 75).

The collaborative sense-making in the RL teams – and additionally, a workshop run by the researchers – gave room to the exchange between different expertise and angles on reality (Aldunce, 2013). 'Risk' and 'resilience' were opened up to critical reflection and 'business as usual' no longer appeared to be the only viable option. However, short-term pressures constrict

these processes and the alternative practice options they could engender. Similarly, as knowledge synergies emerge from practice, this process is met with organisational regulation.

The Department's 'reputational risk management' (B.B., Interview, 2012-2013) is based on and perpetuates a number of assumptions, such as that the public expects government, fire agencies and other 'experts' to be 'in control' of bushfire risk. This assumption is linked to the institutionalised positivist knowledge paradigm, which prioritises 'hard' techno-scientific data over practice knowledge(s) and learning. Within this paradigm, communicating the real life complexities and uncertainties of bushfire risk management consequently appears 'politically impossible'. Accordingly, the Department's culture of bushfire risk communication remains entrenched around a simplistic metric risk concept (Hess and Adams, 2002), despite the known limitations of the scientific evidence and the models in use. Uncertain of what they can or can't say in order to hold the departmental line, practitioners feel compelled to perform 'engagement' as top-down information with a preconceived message rather than as a dialogue. Tight timelines and the priority given to the delivery of outputs that are easily communicated to 'the top' of the administration further limit the scope to get operational practice expertise on board with the development of implementation processes. This not only shuts down a lot of opportunities for practice change and perpetuates a one-solution focussed response that may be out of touch with issues faced by operational staff (C.C.,Interviews, 2012-2013). The findings also suggest that the operational risk concept is constructed around an 'empty core', owing to the (perceived) political need to deliver quantifiable, techno-scientific messages and quick, visible action. In practice, then, one of the Framework's central tenets, to integrate diverse knowledge(s) into a more responsive socio-ecological narrative, is constrained by the dominant 'control over nature' narrative with its reification of knowledge, top-down decision-making and the separation of

social and ecological systems. Constructing (a façade of) certainty, this narrative may also construct a false sense of security, effectively increasing community vulnerability at the additional cost of losing biodiversity and ecological habitats.

The related construction of a somewhat homogenous community remains implicit within this dominant narrative and does not reflect the multiple experiences, perspectives and changing values of Victoria's diverse communities. Indeed, in the practice discourses we observed, these inconsistencies appear to be viewed as something that needs to be 'managed' to fit in with current government practice rather than be integrated into the Framework's strategic ground plans. While this avoidance of dialogue with communities may be grounded in a general lack of participatory platforms, it is preceded by a similar lack of deliberative structures within the Department (S.T., Interviews, 2012-2013). Boxelaar et al. (2006, p. 124) arrive at a similar diagnosis, recommending that agencies 'come to terms with the fact that their organizational structures, processes and practices are constitutive of the social organization of the change process' and, if they remain unreflective and static, may 'compromise the construction of inclusive platforms for change that create a space for diverse participants to participate'. The continuous challenge in this context, as Rijke et al. (2012, p. 76) point out, is that organisations learn to embrace complexity and uncertainty and incorporate reflection and learning into their governance frameworks.

Our approach of cooperative inquiry aims to open up platforms for the articulation of practitioners' thoughts that may otherwise be masked by departmental 'rules of speaking'. Workshops, designed around concepts and processes that the interviews revealed as problematic, bring together a number of practitioners from different agencies and levels of the policy process. Using a conversation mapping technique, the workshops provide the opportunity to rethink

operational terms and processes outside everyday Department business. The conversation encourages critical reflection on the social, political and cultural assumptions that contribute to the construction of the 'problem' of bushfire and its envisioned 'solutions' (Mattsson and Kemmis, 2007; Reason, 1999). As Haigh (2012) argues, such recognition of the interrelationships between the gathering and interpreting of knowledge and its outcomes is a prerequisite of successful changes in policy direction.

The variety of practice expertise represented in the workshops demonstrates that there is likely no one solution to the 'problem' of bushfire management. Rather, a number of creative approaches arise from the practitioners' repertoire of experiences that can work towards positive policy change. In their discussion of the opportunities of structured decision-making in complex environmental policy contexts, Gregory et al (2011, p. 5) stress that in order for policy to be successful over time (i.e. with changing circumstances, values etc), 'conflicting views [should] be viewed not as problems to be hushed or appeased but as opportunities to clarify the reasons behind apparent differences in values and the various interpretations given to factual information'.

CONCLUSIONS

In identifying 'the web of practices' that contribute to, or modify, meaning-making and action in policy implementation, this paper highlights the social dimensions of practice change within public administration. While it presents the local case study of bushfire policy in Victoria, Australia, the paper has wider relevance for similar policy practice contexts internationally, as it makes explicit the scientific and cultural practices incorporated in policy design as well as the on-ground recreation of a dominant narrative, enacted through different practice discourses.

According to Paine's (1997) model, alternative options become visible and emerge from the interplay between diverse practice discourses and ways of knowing. Our findings emphasise that the impetus for social change arises from the interface between policy and practice. This phase of collaborative sense-making and debate, we have argued, can be the most adaptive moment in the policy process as it produces multiple insights into what adaptive management might be. Our study therefore suggests that, when dealing with the governance of complex socio-ecological systems, policy-makers can benefit from acknowledging the social dynamics of practice inherent in policy formulation, provided that the ensuing opportunities for flexible practice are not closed down by institutionalised discourses. Our collaborative research approach seeks to support this process, further institutionalising the learning reported here with the planning of future workshops involving the research team and our agency partners.

A conscious opening towards knowledge as (often fragmented) process requires parting with traditional 'science to policy' paradigms (Schön, 1995). In a potentially messy reality, this appreciation of multiple knowledge(s) is the basis for adaptive learning (Westley, 2002). Bringing into play numerous alternative discourses, values and social experiences, we argue, is the prerequisite for innovation and integrative adaptive policymaking. A remaining challenge for governments is devolution from a paternalistic approach to policy, with 'government' as gate keeper of knowledge and action, to one that acknowledges and communicates uncertainty in a way that enables people in communities to define and judge risk themselves. This challenge recalls ideas such as participatory democracy that open opportunities for adaptive governance from the location of practice and from *beyond* the policy domain, acknowledging complexity and giving it 'room to play' at the margins (Brunner et al., 2005; Ostrom, 2010; Voß et al., 2006).

Last but not least, as researchers, we too are faced with a number of challenges. An ethical consideration is the need to strike a balance between helpfully *revealing* practices to aid critical reflection on the one hand, and *protecting* their emergence on the other, so as to not prematurely expose these processes to institutional intervention. This observation emphasizes the need for the collaborative research program proposed here and goes to the heart of its purpose: to give voice to valuable practice expertise and those at the coal-face of everyday policy practice. By formulating a social research program that helps research, policy and practice to learn from one another, this study is seeking to support such dialogue now and enable its continuation into the future, towards more informed, flexible policy and practice approaches that improve social-ecological resilience and, ultimately, strengthen civic society.

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